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AUTHOR Brehman, George E., Jr.
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ABSTRACT

An evaluation of the faculty workload in Pennsylvania's state-owned higher education institutions is presented. Tabular and text data show: faculty workload in terms of full-time equivalent (FTE) student/faculty instruction ratio, student credit hours, student-contact hours, and credit-hour cost; relationship of average full credit-hour cost per student credit-hour to average FTE faculty member student credit-hour production; percent of total credit-hour production by programs and rank order of programs; actual state-owned colleges and university FTE instructional faculty counts compared with criterion FTE faculty counts that are based on FTE student/FTE faculty ratios falling at the medium; indicated numerical and percentage reduction in FTE faculty size under three different FTE-student, FTE-faculty ratios; and FTE-faculty/FTE student ratios by levels and overall for each state-owned institution. (SPG)

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ED157458

A STUDY OF FACULTY WORKLOAD IN PENNSYLVANIA STATE-OWNED INSTITUTIONS OF HIGHER EDUCATION, 1975-77

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Prepared by
George E. Brehman Jr.
Division of Research
Bureau of Information Systems
Pennsylvania Department of Education
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Bureau of Information Systems
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Division of Research
Robert B. Hayes, Director

Pennsylvania Department of Education
Box 911
Harrisburg, Pa. 17126

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SUMMARY

Purpose

The purpose was to evaluate faculty workload in Pennsylvania's state-owned higher education institutions.

Procedures

Procedures used were: (1) citation of relevant literature on faculty workload from the previous report; (2) analysis of data provided in the Common Cost Accounting Report, Pennsylvania State Colleges and University, FY 1974-75, FY 1975-76 and FY 1976-77, Computer Printouts; (3) synthesis of relevant data to show a two-year comparison of 1975-76 with 1976-77 and, in one instance, comparisons over the period from 1974-75 to 1976-77; and (4) appraisal of relative productive efficiency.

Results

The typical (median) full-time equivalent (FTE) student-faculty institutional ratio was 18.35:1 in FY 1975-76 and 18.03:1 in FY 1976-77, a slight decrease. FTE faculty productivity in terms of student-credit hours decreased by 38,580 hours, or 1.7 per cent, 1975-76 to 1976-77. Rank order correlation between average credit-hour production per FTE faculty member and average full credit-hour cost increased slightly from .60 to .64, but the rank order correlation of production per FTE faculty member with instructional credit-hour cost decreased from .78 to .68 during the period 1975-76 to 1976-77. This suggests that instructional productivity and instructional costs became less closely related during this period, while the relationship of instructional productivity to total costs remained relatively constant.

Total student credit-hour production in education declined 4.8 per cent between 1974-75 and 1975-76 and an even larger decline--9.6 per cent--took place between 1975-76 and 1976-77. Business/management, health professions, public affairs/services, communications and computer sciences experienced notable gains in student credit-hour production 1975-76 to 1976-77, while interdisciplinary studies, mathematics, letters, foreign languages, and library science experienced substantial declines.

The distribution of current FTE student/faculty ratio values is seen as potentially helpful to the state-owned colleges in developing goal ratio values that would increase faculty productivity without going beyond the range of ratio values that now characterize these institutions.

The state-owned colleges can take a leadership role in exploring the value of technology and instructional mode variation in permitting increased productivity in terms of higher FTE student/FTE faculty ratios in addition to more conventional approaches such as nonreplacement of faculty.

This study is an updated and revised version of the May 1977 (Revised) report by Frank M. Durkee entitled A Study of Faculty Workload in Pennsylvania Colleges and University, 1973-76. The revision consists primarily of reliable data from the annual Common Cost Accounting Reports submitted by the state-owned colleges and university. Not all of Durkee's tables are replicated and a somewhat different approach to a criterion for faculty-student ratio standards has been adopted.

Faced with a prospective enrollment decline, higher costs and limited resources, higher education is trying to increase its productivity. But even with increased efficiency and restraint in all areas of the higher education operation, greater productivity--more for the education dollar--is still largely a function of the workload of the full-time equivalent (FTE) faculty, whose salaries require a substantial portion of higher education funds,

In Pennsylvania's state-owned higher education institutions the cost for personnel is even higher and, in 1976-77, required 78 per cent of the total expenditures reported in the Common Cost Accounting Reports, Pennsylvania Department of Education.

Faculty Workload in Higher Education

Faculty workload can be examined in terms of average number of instructional hours per week, student/faculty ratios, average class size, average student credit-hours produced per full-time equivalent faculty member, average number of student-contact hours, and noninstructional activities. Even within all operational constraints, e.g., 12 class hours per week per FTE faculty member, however, faculty productivity can be increased by faculty development programs that inculcate new skills and attitudes.[1]

The question of greater faculty workload to increase higher education productivity has been getting serious attention in the 1970s. From 1972 to 1975 faculty workload in the Florida State University System increased 20 per cent, largely because of pressure from the legislature.[2] Against the opposition of the State Board of Education, the Massachusetts legislature wrote into its appropriation bill a requirement that faculty on any state campus spend at least 12 hours per week in classrooms or laboratories.[3] In 1971, Michigan legislated a minimum load of 15-credit hours, or 450 student credit-hours, for a full-time faculty member. New York State University Rules and Regulations changed the student/faculty ratio from 15:1 to 17:1. The Maryland legislature, in 1973, moved to have community colleges reach a student/faculty ratio of 20:1.[4]

Besides economic pressures from state legislatures, new modes of instruction--auto-tutorial, open laboratory, television, video cassette, video disk, etc.--strongly suggest the possibility of a change in the current concept of appropriate class size in the direction of more FTE students for each FTE faculty member because of their potential for the efficient instruction of a larger number of students.

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[1]Bergquist, William H. and Steven R. Phillips. "Components of an Effective Faculty Development Program." The Journal of Higher Education, March/April, 1975.

[2]Magarell, Jac. "They're Putting Lids on Enrollments," The Chronicle of Higher Education, November 3, 1975, p. 1.

[3]The Chronicle of Higher Education, June 10, 1974, p. 6.

[4]Lombardi, John. Faculty Workload, University of California, Los Angeles, October 1974. ED-097-925.

Workload in Pennsylvania State-Owned Higher Education Institutions

Tables 1 and 2 provide basic data on faculty workload in the state-owned colleges and university. The median full-time equivalent student/faculty ratio dropped somewhat from a value of 18.35 in 1975-76 to 18.03 in 1976-77. A median of 18.68 in 1974-75 was reported by Durkee in his prior study of faculty workload.[5]

In the same period (1975-77) the total FTE faculty complement at the state-owned institutions decreased by 48, but there was also an overall decrease of 1,362 in the number of FTE students. This, therefore, resulted in only a small drop in the student/faculty ratio as noted previously. As might be expected, there was also a similar drop in the degree of FTE faculty productivity in terms of total student-credit hours, which decreased 38,580, 1.66 per cent drop in productivity. Average (median) credit-hour production per FTE faculty member also dropped from 538.2 to 526.7, a decline of 4.68 per cent. Average total student-contact hours per FTE faculty member decreased from 220.2 hours to 216.0 hours (1.9 per cent) for the average state-owned institution.

Average instructional credit-hour cost increased by $4.32 during this two-year period, i.e., from $46.84 to $51.16, an average increase in per credit-hour cost of 9.2 per cent. Table 3 attempts to permit a comparison between 1975-76 and 1976-77 with regard to student credit hour cost (column 3 of Tables 1 and 2) and average credit-hour production (column 5 of Tables 1 and 2) by computing the change in cost or production and ranking the institutions on all values shown to permit convenient interinstitutional comparisons. The rank order correlations between the average total credit-hour production per FTE faculty member and the average instructional credit-hour cost of Table 3 were .78 for 1975-76 and .68 for 1976-77. Corresponding rank order correlations between average total credit-hour production per FTE faculty member and average full credit-hour cost were more similar to each other, i.e., .60 and .64. This suggests that instructional productivity and institutional costs became less closely related between 1975-76 and 1976-77, but that the relationship between total costs and productivity remained relatively constant, or even increased slightly. This reduction of the instructional cost to instructional productivity relationship may have been due in part to the slight reduction in the FTE student/FTE faculty ratio from 18.35 to 18.03.

Student-Credit Hours Produced

Better than degrees granted or any other quantitative criterion, student-credit hours are the most complete measure of higher education output and related FTE faculty workload. Accordingly, Table 4 gives the percentage of total credit-hour production for selected academic programs and ranks each program in terms of credit-hour production over all state-owned institutions. Significantly, education dropped in credit-hour production as a percentage of all credit-hour production from 41.4 per cent in 1974-75 to 35.3 per cent in 1976-77 while remaining first in rank in relation to the other programs.

Some programs that show a decline in productivity and in relative ranking are: interdisciplinary studies, which declined from 3.9 per cent to 2.3 per cent and from 6th to 10th among the 21 programs; letters, which declined from 4.5 per cent to 3.2 per cent and from 5th to 8th; mathematics, which declined from 3.3 per cent to 1.9 per cent and from 8th to 12th; foreign languages, which declined from 1.9 per cent to 1.2 per cent and from 13th to 15th; and library science, which declined from 0.9 per cent to 0.5 per cent and from 15th to 17th place.

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[5]Durkee, Frank M. A Study of Faculty Workload in Pennsylvania Colleges and University 1973-76, Division of Research, Bureau of Information Systems, Pennsylvania Department of Education, May 1977 (Revised).

Table 1

Faculty Load at State-Owned Higher Education Institutions, 1975-76, in Terms of FTE Student/Faculty Instruction Ratio, Student Credit-Hours, Student-Contact Hours, and Credit-Hour Cost

Institution	FTE Students[1]	FTE Direct Inst. Faculty[1]	FTE Student Inst. Faculty Ratio[2]	Total Student Credit-Hours[1]	Credit-Hr. Production Per FTE Faculty[3]	Rank[4]	FTE Fac. Av.Total Student-Contact Hours[5]	FTE Direct Inst. Cost[1]	FTE Total Cost[1]	AV. Inst. Cr.-Hr. Cost[1]	Rank[4]	Av. Full Credit-Hour Cost[1]	Rank[4]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Bloomsburg	5,956	290	20.54	175,604	605.5	1	246.5	$1,179.66	$3,055.23	$40.01	1	$103.62	2
California	5,314	323	16.45	156,402	484.2	10	197.4	1,537.47	3,486.39	52.23	10	118.43	10
Cheyney	2,540	172	14.77	75,604	437.6	13	177.2	1,679.19	4,479.80	56.66	14	151.17	14
Clarion	5,388	275	19.59	159,741	580.9	3	235.1	1,393.61	3,385.38	47.00	8	114.18	7
E.Stroudsburg	4,293	212	20.25	127,239	600.2	2	243.0	1,334.38	3,308.64	45.02	3	111.63	6
Edinboro	6,740	425	15.86	198,139	466.2	12	190.3	1,538.07	3,169.07	52.32	11	107.80	5
Indiana	11,690	604	19.35	345,489	572.0	5	232.2	1,346.44	2,921.03	45.55	5	98.85	1
Kutztown	5,174	283	18.28	152,435	538.6	7	219.4	1,359.96	3,233.86	46.15	6	109.76	4
Lock Haven	2,604	162	16.07	78,121	482.2	11	192.8	1,578.55	4,060.15	56.61	13	135.33	12
Mansfield	3,240	221	14.06	96,082	434.8	14	168.7	1,628.27	4,182.59	54.90	12	141.03	13
Millersville	5,766	313	18.42	168,309	537.7	8	221.0	1,415.00	3,547.66	48.47	9	121.52	11
Shippensburg	5,438	286	19.01	157,778	551.7	6	228.1	1,314.91	3,340.54	45.31	4	115.12	8
Slippery Rock	6,300	320	19.69	185,532	579.8	4	236.3	1,374.55	3,442.18	46.67	7	116.88	9
West Chester	8,635	476	18.14	252,318	530.1	9	217.7	1,301.76	3,082.49	44.55	2	105.49	3
All Combined[6]	79,078	4,361	18.13	2,328,452	533.9		217.6	1,396.56	3,336.46	47.42			
Median	5,413.0	288.0	18.35	158,759.5	538.2		220.2	1,384.08	3,362.96	46.84		114.65	
Mean	5,648.4	330.8	17.93	166,318.0	528.7		214.7	1,427.27	3,478.26	48.68		117.92	

[1]Source of data in the Common Cost Accounting Report, Pennsylvania State Colleges and University, FY 1975-76, Office of Administrative Management, Pennsylvania Department of Education.

[2]Column (1) ÷ column (2) = column (3).

[3]Column (4) ÷ column (2) = column (5).

[4]Credit-Hour Production per FTE Student is ranked from highest production (rank of 1) to lowest and Average FTE Instructional Credit-Hour Cost and Average Full Credit Hour Cost are ranked from lowest (rank of 1) to highest cost.

[5]Column (3) x 12-hours per week teaching load = column (7).

[6]These values are simply sums in the case of columns 1, 2 and 4 but otherwise the values shown are calculated or cited as footnoted above using the totals of columns, 1, 2 and 4 and represent average values for the system as a whole rather than values for the typical institution in the system. They, therefore, differ somewhat from the median and mean institutional values shown below.

Table 2

Faculty Load at State-Owned Higher Education Institutions, 1976-77, in Terms of FTE Student/Faculty Instruction Ratio, Student-Credit Hours, Student-Contact Hours, and Credit-Hour Cost

Institution	FTE Students[1]	FTE Direct Inst. Faculty[1]	FTE Student Inst. Faculty Ratio[2]	Total Student Credit Hours[1]	Credit-Hr. Production Per FTE Faculty[3]	Rank[4]	FTE Fac. Av.Total Student-Contact Hours[5]	FTE Direct Inst. Cost[1]	FTE Total Cost[1]	Av. Inst. Cr.-Hr. Cost[1]	Rank[4]	Av. Full Credit-Hour Cost[1]	Rank[4]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Bloomsburg	6,114	312	19.60	180,444	578.4	2	235.2	$1,274.69	$3,166.28	$43.19	1	$107.29	2
California	4,937	307	16.08	145,076	472.6	6	193.0	1,656.54	3,745.99	56.36	12	127.46	10
Cheyney	2,721	179	15.20	80,488	449.7	12	182.4	1,548.11	4,382.04	52.32	11	148.11	13
Clarion	5,286	251	21.06	156,668	624.2	1	252.7	1,534.12	3,595.55	51.76	9	121.32	7
E.Stroudsburg	4,363	225	19.39	128,675	571.9	7	232.7	1,346.72	3,411.48	45.66	3	115.68	4
Edinboro	6,201	409	15.16	182,471	446.1	13	181.9	1,691.69	3,440.87	57.48	13	116.92	6
Indiana	11,895	611	19.47	351,577	575.4	3	233.6	1,341.04	2,963.14	45.37	2	100.25	1
Kutztown	4,801	275	17.46	141,666	515.2	10	209.5	1,524.06	3,600.18	51.65	8	122.01	8
Lock Haven	2,443	152	16.07	73,299	482.2	11	192.8	1,564.24	4,317.79	52.14	10	143.92	12
Mansfield	2,995	203	14.75	88,951	438.2	14	177.0	1,775,36	4,617.63	59.78	14	155.50	14
Millersville	5,713	319	17.91	166,940	523.3	9	214.9	1,460.58	3,736.17	49.98	6	127.86	11
Shippensburg	5,623	285	19.73	163,914	575.1	4	236.8	1,353.58	3,406.58	46.43	4	116.85	5
Slippery Rock	6,189	319	19.40	182,791	573.0	5	232.8	1,496.22	3,606.68	50.66	7	122.12	9
West Chester	8,433	465	18.14	246,912	530.1	8	217.7	1,385.70	3,267.10	47.32	5	111.58	3
All Combined[6]	77,716	4,313	18.02	2,289,872	530.9		216.2	1,466.50	3,503.69	49.77			
Median	5,454.5	296	18.03	160,291.0	526.7		216.0	1,510.14	3,597.87	51.16		121.67	
Mean	5,551.0	308	17.82	163,562.3	525.4		216.3	1,496.59	3,661.25	50.72		124.06	

[1]Source of data is the Common Cost Accounting Report, Pennsylvania State Colleges and University, FY 1976-77, Office of Administrative Management, Pennsylvania Department of Education.

[2]Column (1) ÷ column (2) = column (3).

[3]Column (4) ÷ column (2) = column (5).

[4]Credit-Hour Production per FTE Student is ranked from highest production (rank of 1) to lowest and Average FTE Instructional. Credit-Hour Cost and Average Full Credit-Hour Cost are ranked from lowest (rank of 1) to highest cost.

[5]Column (3) x 12-hours per week teaching load = column (7).

[6]These values are simply sums in the case of columns 1, 2 and 4 but otherwise the values shown are calculated or cited as footnoted above using the totals of columns 1, 2 and 4 and represent average values for the system as a whole rather than values for the typical institution in the system. They, therefore, differ somewhat from the median and mean institutional values shown below.

Table 3

Relationship of Average Full Credit-Hour Cost Per Student Credit-Hour to Average Full-Time Equivalent Faculty Member Student Credit-Hour Production in State-Owned Higher Education Institutions, FY 1975-76 and FY 1976-77

Institution[1]	1975-76 Average Full Per Stud.Cred. Hour Cost[2]	Rank[3]	1976-77 Average Full Per Stud.Cred. Hour Cost[2]	Rank[3]	1975-76 Average Cred.Hr. Prod.Per FTE Fac. Member[4]	Rank[5]	1976-77 Average Cred.Hr. Prod.Per FTE Fac. Member[4]	Rank[5]	1975-76 to 1976-77 Increase Average SCH Cost	Rank[6]	1975-76 to 1976-77 Change in CHP Per FTE Faculty Member	Rank[7]
Indiana	$ 98.85	1	$100.25	1	572.0	5	575.4	3	$ 1.40	2	3.4	4.5
Bloomsburg	103.62	2	107.29	2	605.5	1	578.4	2	3.67	4	-23.7	1.3
West Chester	105.49	3	111.58	3	530.1	9	530.1	8	6.09	7	0.0	6.5
Kutztown	109.76	4	122.01	8	538.6	7	515.2	10	12.25	13	-23.4	12
Edinboro	107.80	5	116.92	6	466.2	12	446.1	13	9.12	12	-20.1	11
E.Stroudsburg	111.63	6	115.68	4	600.2	2	571.9	7	4.05	5	-28.3	14
Clarion	114.18	7	121.32	7	580.9	3	624.2	1	7.14	9	43.3	1
Shippensburg	115.12	8	116.85	5	551.7	6	575.1	4	1.73	3	23.4	2
Slippery Rock	116.88	9	122.12	9	579.8	4	573.0	5	5.24	6	- 6.8	8
California	118.45	10	127.46	10	484.2	10	472.6	6	9.01	11	-11.6	9
Millersville	121.52	11	127.86	11	537.7	8	523.3	9	6.34	8	-14.4	10
Lock Haven	135.33	12	143.92	12	482.2	11	482.2	11	8.59	10	0.0	6.5
Mansfield	141.03	13	155.50	14	434.8	14	438.2	14	14.47	14	3.4	4.5
Cheyney	151.17	14	148.11	13	437.6	13	449.7	12	-3.06	1	12.1	3

[1]Source of institutional data in the Common Cost Accounting Report, Pennsylvania State Colleges and University for FY 1975-76 and FY 1976-77, Office of Administrative Management, Pennsylvania Department of Education.

[2]Taken from column (3) of Table 1 or 2.

[3]Ranked from lowest cost to highest cost.

[4]Taken from column (5) of Table 1 or 2.

[5]Ranked from highest Credit-Hour Production Per FTE Faculty Member to lowest production.

[6]Ranked from least increase in Student Credit-Hour Cost to greatest increase in cost.

[7]Ranked from largest increase in Credit-Hour Production Per FTE Faculty Member to smallest increase.

Table 4

Total Credit-Hour Production of State-Owned Higher Education Institutions, 1974-75, 1975-76 and 1976-77, Per Cent of Total Production by Programs and Rank Order of Programs

Program[1]	1974-75 Total Cr.-Hr. Production	1974-75 Per Cent of Total	1975-76 Total Cr.-Hr. Production	1975-76 Per Cent of Total	1976-77 Total Cr.-Hr. Production	1976-77 Per Cent of Total	1974-75 Rank	1975-76 Rank	1976-77 Rank	1974-77 Change in Rank[2]
Education	940,834	41.4	895,810	38.5	810,049	35.5	1	1	1	0
Social Sciences	287,852	12.6	277,266	11.9	263,422	11.5	2	2	3	-1
Business/Management	195,456	8.6	229,149	9.8	275,104	12.0	3	3	2	1
Biological Sciences	106,703	4.7	100,189	4.3	93,660	4.0	4	4	5	-1
Letters	103,807	4.5	80,446	3.5	74,116	3.2	5	7	8	-3
Interdisciplinary	89,387	3.9	87,273	3.7	54,496	2.3	6	5	10	-4
Psychology	86,938	3.8	85,503	3.7	82,096	3.5	7	6	6	1
Mathematics	75,889	3.3	55,878	2.4	45,248	1.9	8	11	12	-4
Fine, Applied Arts	72,230	3.1	58,068	2.5	66,926	2.9	9	10	9	0
Health Professions	60,116	2.6	67,127	2.9	75,343	3.2	10	9	7	3
Physical Sciences	59,917	2.6	48,858	2.1	46,265	2.0	11	12	11	0
Public Affairs/Ser.	53,504	2.3	72,772	3.1	94,909	4.1	12	8	4	8
Foreign Languages	44,699	1.9	34,510	1.5	28,648	1.2	13	13	15	-2
Home Economics	37,266	1.6	31,307	1.3	34,641	1.5	14	14	13	1
Library Science	22,171	0.9	17,713	0.8	12,347	0.5	15	16	17	-2
Communications	20,804	0.9	25,510	1.1	31,582	1.3	16	15	14	2
Computer Science	7,641	0.3	12,580	0.5	19,548	0.8	17	17	16	1
Health/Para-Med.	2,724	0.1	2,778	0.1	2,964	0.1	18	18	19	-1
Architecture	1,461	0.06	1,820	0.07	1,650	0.0	19	19	20	-1
Area Studies	914	0.04	748	0.03	712	0.0	20	21	21	-1
Engineering		0.00	991	0.04	3,597	0.1	21	20	18	3
Total	2,270,323		2,328,452		2,289,873					

[1]Source of Data: Common Cost Accounting Report, Pennsylvania State Colleges and University, FY-1974 75, FY 1975-76 and FY 1976-77, Office of Administrative Management, Pennsylvania Department of Education.

[2]Positive change indicates increased production relative to total production, negative change decreased production over time between FY 1974-75 and FY 1976-77.

Two programs increased their proportionate contributions to the total credit-hour production over the years 1974-1977 but remained little changed in their relative ranking. Business and management rose from 8.6 per cent in 1974 to 12.0 per cent in 1977 but, in terms of program ranking, went from the 3rd to 2nd place position just behind education. Some programs showed a positive change in terms of both ranking and proportionate productivity. Public affairs rose from 2.3 per cent to 4.1 per cent of the total credit-hour productivity and, in rank, went from 12th to 4th place. The health professions rose from 2.6 per cent to 3.2 per cent and from 10th to 7th place. Communications rose from 0.9 per cent to 1.3 per cent and from 16th to 14th. Engineering went from 0.0 per cent to 0.1 per cent and from 21st (last) place to 18th. Computer science, though not a large program, increased its share from 0.3 per cent in 1974-75 to 0.8 per cent in 1976-77 and rose in rank order of production from 17th to 16th.

Obviously, these changes might also reflect change in student demand, and/or institutional priorities as well as changes in the student/faculty ratios reflecting faculty workload.

Class Size and Faculty Workload

With faculty instructional hours limited by contract to 12 hours per week per semester, or its equivalent, the number of students per section becomes an important determiner of faculty workload.

It is obvious, however, that there is no uniform size that can be imposed upon all classes. A class size of 25 would be impossible in terms of teaching instrumental mastery to a music student, where a 1:1 ratio may be required. But, it is equally unreasonable to have a class of 10 students in a subject area well suited to the use of large lecture sessions, TV, audio-visual aids, etc. in light of the current budgetary constraints in higher education. To the extent that certain sections fall below a size of 20 FTE students, not because they are in areas where small class size is appropriate and necessary for adequate instruction (music, art, foreign languages) but rather because there is a lack of demand or excessive faculty allocation relative to demand, reduction or reassignment of faculty would be possible.

Are large sections of 35-50 too large? This depends upon the subject being taught, the mode of instruction and the degree to which modern communications technology is being used in teaching. The state colleges might well take the lead in experimenting with ways in which all institutions might get more for the education dollar without sacrificing the essential value of small classes mandated by the subject or method of instruction.

FTE Faculty Efficiency in Terms of
Average Student-Credit Hours

It is possible to set up a goal FTE faculty criterion and then compare the actual FTE faculty for each institution with the number required to meet the criterion value. This may be desirable, since many institutions may need a way of establishing a goal and of ascertaining when this goal has been accomplished.

In the prior report on faculty workload, Durkee specifies a criterion based upon an assumption of an average class size of 25 students per class where the typical faculty member teaches four classes of three hours each and does this for two semesters. He thus arrives at a student-credit hour value of 600 SCH's per faculty member.

This approach results in a single criterion of how many FTE faculty a given institution should have and assumes a fairly large class size relative to the 18 to 1 average FTE student to FTE faculty ratio cited earlier in this report. A given institution, while accepting the principle of increased productivity by raising this ratio, might well choose to have a more moderate goal or even a more ambitious one. Table 5, therefore, sets up several criterion faculty comparisons based on three separate criteria. These criteria are based upon degrees of variability from the median FTE student/faculty ratio of approximately 18:1 found in both Tables 1 and 2.

The first (median) comparisons of Tables 5 and 6 use the criterion of matching or exceeding the number of FTE faculty required to bring all 14 institutions up to at least a median student faculty ratio of 18. As can be seen, for 1975-76, only five institutions would need to either reduce the number of FTE faculty or increase the number of FTE students to meet the criterion of 18 FTE students per FTE faculty member. These five institutions were California with 27.8 excess FTE faculty requiring an 8.6 per cent reduction to reach the criterion; Cheyney with 30.9 excess FTE faculty requiring an 18 per cent reduction; Edinboro with 50.6 excess FTE requiring an 11.9 per cent reduction; Lock Haven with 17.3 excess FTE faculty requiring a 10.7 per cent reduction; and Mansfield with 41 excess faculty requiring an 18.6 per cent reduction. Altogether these five institutions would have to reduce the FTE faculty by 167.6 persons or 12.86 per cent of their total FTE faculty.

In 1976-77, however, we see (in Tables 5 and 6) that seven, rather than five, institutions could not meet the median criterion. These seven institutions would have to reduce their FTE faculties by some 187.8 persons to reach the median criterion of 18. This is an overall 9.9 per cent reduction in the faculties of these institutions although the reductions required would, of course, vary widely from institution to institution.

In Tables 5 and 6 a somewhat more rigorous criterion ratio of 19 FTE st[illegible]s per FTE faculty member has also been used. The ratio of 19:1 is the ratio abo[illegible]h we find only a fourth (25 per cent) of the state-owned institutions, i.e., the [illegible] at the 75th percentile. As might be expected with this more ambitious criterion as a goal, a larger number of institutions would have to reduce their FTE faculty or increase their FTE student enrollments to meet this criterion (Tables 5 and 6). Eight institutions were found to be below the criterion both years; a greater reduction would be required in 1976-77 than in 1975-76, i.e., 296.2 compared with 269.0 FTE faculty.

A third and more stringent criterion is 20 FTE students to one FTE faculty member. This criterion is based upon the ratio that lies one half the distance between the previous criterion percentile of 75 per cent and the most extreme institutional ratio possible, the 100 percentile. This criterion (at the 87.5 percentile) requires that an even larger number of institutions make some reduction in FTE faculty. According to Tables 5 and 6, 12 institutions in 1975-76 and 13 institutions out of the 14 state-owned colleges in 1976-77 were below the criterion ratio of 20:1 and the overall reductions required were 418.5 in 1975-76 and 439.0 in 1976-77.

Of course, such reductions are not easily made. The findings shown here simply suggest a method for setting goals that do not seem unreasonable, since some institutions are already at or beyond the criteria set here. In fact, as of 1976-77, the individual institutional FTE student/FTE faculty ratios went as high as 21.06 to 1 and as low as 15.20 to 1 (Table 2, column 3).

We see then that current FTE manpower relative to FTE student enrollment does not provide an optimum level of instructional efficiency on the basis of any

Table 5

Actual State-Owned Colleges and University FTE Instructional Faculty Counts for 1975-76 and 1976-77 Compared With Criterion FTE Faculty Counts That are Based Upon FTE Student/FTE Faculty Ratios Falling at the Median, the 75th and 87.5th Percentile

Institution	1975-76 FTE Instruct. Faculty[1]	1975-76 Median Criterion Faculty[2]	1975-76 75th Percentile Criterion Faculty[3]	1975-76 87.5th Percentile Criterion Faculty[4]	1976-77 FTE Inst. Faculty[5]	1976-77 Median Criterion Faculty[6]	1976-77 75th Percentile Criterion Faculty[7]	1976-77 87.5th Percentile Criterion Faculty[8]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bloomsburg	290	330.9	313.5	297.8	312	339.7	321.8	305.7
California	323	295.2	279.7	265.7	307	274.3	259.8	246.9
Cheyney	172	141.1	133.7	127.0	179	151.2	143.2	136.1
Clarion	275	299.3	283.6	269.4	251	293.7	278.2	264.3
E.Stroudsburg	212	238.5	225.9	216.7	225	242.4	229.6	218.2
Edinboro	425	374.4	354.7	337.0	409	344.5	326.4	310.1
Indiana	604	649.4	615.3	584.5	611	665.8	626.1	594.8
Kutztown	283	287.4	272.3	258.7	275	266.7	252.7	240.1
Lock Haven	162	144.7	137.1	130.2	152	135.7	128.6	122.2
Mansfield	221	180.0	170.5	162.0	203	166.4	157.6	149.8
Millersville	313	320.3	303.5	288.3	319	317.4	300.7	285.7
Shippensburg	286	302.1	286.2	271.9	285	312.4	295.9	281.2
Slippery Rock	320	350.0	331.6	315.0	319	343.8	325.7	309.5
West Chester	476	479.7	454.5	431.8	465	468.5	443.8	421.7
All Combined	4,361	4,393.2	4,162.1	3,954.0	4,313	4,317.5	4,090.3	3,885.8

[1]From Table 1, column (2).

[2]The values in this column are the result of dividing the number of FTE students in Table 1, column (1) by 18, which is the median number of FTE students per FTE faculty member when rounded to the nearest whole number.

[3]As in footnote 2, above, but uses a ratio of 19:1, i.e. the ratio which only 25 per cent of the state-owned colleges and universities would exceed.

[4]As in footnotes 2 and 3, above, but using a ratio of 20:1, i.e., the ratio above which only 12-1/2 per cent of the institutions would fall.

[5]From Table 2, column (2).

[6]As in footnote 2, above.

[7]As in footnote 2, above.

[8]As in footnote 4, above.

Table 6

Indicated Numerical and Percentage Reduction in FTE Faculty Size Under Three Different FTE-Student, FTE-Faculty Ratios for the State-Owned Colleges and University

Institution	1975-76 Median Criterion Surplus[1]	Indicated Per Cent Reduction in FTE Faculty[2]	1975-76 75th Percentile Criterion Surplus[1]	Indicated Per Cent Reduction in FTE Faculty[2]	1975-76 87.5th Percentile Criterion Surplus[1]	Required Per Cent Reduction in FTE Faculty[2]	1976-77 Median Criterion Surplus[3]	Indicated Per Cent Reduction in FTE Faculty[4]	1976-77 75th Percentile Criterion Surplus[3]	Indicated Per Cent Reduction in FTE Faculty[4]	1976-77 87.5th Percentile Criterion Surplus[3]	Indicated Per Cent Reduction in FTE Faculty[4]
	#	%	#	%	#	%	#	%	#	%	#	%
Bloomsburg	-	-	-	-	-	-	-	-	-	-	6.3	- 2.0
California	27.8	- 8.6	43.3	-13.4	57.3	-17.7	32.7	-10.7	47.2	-15.4	60.1	-19.6
Cheyney	30.9	-18.0	38.3	-22.3	45.0	-26.2	27.8	-15.5	35.8	-20.0	42.9	-24.0
Clarion	-	-	-	-	5.6	- 2.0	-	-	-	-	-	-
E.Stroudsburg	-	-	-	-	-	-	-	-	-	-	6.8	- 3.0
Edinboro	50.6	-11.9	70.3	-16.5	88.0	-20.7	64.5	-15.8	82.6	-20.2	98.9	-24.2
Indiana	-	-	-	-	19.5	- 3.2	-	-	-	-	16.2	- 2.7
Kutztown	-	-	10.7	- 3.8	24.3	- 8.6	8.3	- 3.0	22.3	- 8.1	34.9	-12.7
Lock Haven	17.3	-10..	24.9	-15.4	31.8	-19.6	16.3	-10.7	23.4	-15.4	29.8	-19.6
Mansfield	41.0	-18.6	50.5	-22.9	59.0	-26.7	36.6	-18.0	45.4	-22.4	53.2	-26.2
Millersville	-	-	9.5	- 3.0	24.7	- 7.9	1.6	- 0.5	18.3	- 5.7	33.3	-10.4
Shippensburg	-	-	-	-	14.1	- 4.9	-	-	-	-	3.8	- 1.3
Slippery Rock	-	-	-	-	5.0	- 1.6	-	-	-	-	9.5	- 3.0
West Chester	-	-	21.5	- 4.5	44.2	- 9.3	-	-	21.2	- 4.6	43.3	- 9.3
Total	167.6	-	269.0		418.5		187.8		296.2		439.0	

[1]Differences between FTE instructional faculty in 1975-76 and the criterion faculty estimates that indicates that the actual faculty (FTE) size exceeds that indicated by the criterion in question.

[2]Percentage of the actual 1975-76 FTE faculty that would be regarded as surplus based upon the criterion used.

[3]Differences between FTE instructional faculty in 1976-77 and the criterion faculty estimates indicating that the actual faculty (FTE) size exceeds that indicated by the criterion in question.

[4]Percentage of the actual 1976-77 FTE faculty that would be regarded as surplus based upon the criterion used.

of the criteria of Tables 5 and 6 since the institutions now vary widely in their FTE student/faculty ratios. A reduction in this variance would seem desirable from a productivity point of view. It is recognized, however, that if institutions have exceptional conditions, they may need more than average staffing to cope with student needs. Only the institution itself can properly assess its situation with regard to the specific courses and programs that may represent such exceptions. Data currently available at the state level permit no such analysis.

An institution may desire to set more precise goals than are found in Tables 5 and 6. For example, on the basis of the principle that student/faculty FTE ratios are necessarily different at different education levels, Table 7 might be consulted for possible criterion student/faculty ratios. At the bottom of Table 7, the median, 75th percentile and 87.5th percentile FTE student/FTE faculty ratios are shown as well as individual institution ratios. These ratios are broken down by academic level for each of the two years and for both years combined.

Table 7 suggests that one might set target ratios for the lower division at 19:1, for the upper division at 17:1 or 18:1, and for the graduate level at 15:1 (based on median institution values). If the 75th percentile standard is used, then the ratios would be 21:1, 18-19:1 and 17-18:1 for the lower, upper and graduate levels respectively. Finally, if the 87.5th percentile standard is adopted, Table 7 suggests the use of 21-22:1, 19:1 and 18:1 as the lower, upper and graduate level ratio goal values.

In the light of the current fiscal crisis, the rapidly rising costs of higher education and the impending demographic decline in the traditional college-age group, it may be desirable (1) that steps be taken to use modern technology, (2) that nonstrategic faculty lost through retirement and attrition not be replaced, (3) that there be restrictions on hiring, and (4) that there be a careful assessment of the nature and necessity of existing programs and courses. The objective, then, is to increase faculty productivity and, by implication, increase the FTE student/faculty ratio without unduly impairing the educational process.

Table 7

FTE Faculty/FTE Student Ratios by Levels and Overall for Each State-Owned Institution, 1975-76 and 1976-77, as Well as for Both Years Combined, With Median and Percentile Criterion Standards by Level and Overall

Institution	All Levels 1975-76	1975-76 Lower	1975-76 Upper	1975-76 Grad.	All Levels 1976-77	1976-77 Lower	1976-77 Upper	1976-77 Grad.	Both Yrs. All Levels	Both Yrs. Lower	Both Yrs. Upper	Both Yrs. Grad.
Bloomsburg	20.54	22.12	19.07	18.74	19.60	20.87	18.77	16.49	20.02	21.46	18.92	17.56
California	16.45	17.10	16.84	12.51	16.08	16.96	16.82	11.53	16.27	17.03	16.83	12.00
Cheyney	14.77	16.40	13.85	12.61	15.20	17.96	13.57	11.80	14.99	17.21	13.71	12.15
Clarion	19.59	22.44	18.35	9.52	21.06	23.06	20.30	13.50	20.29	22.74	19.27	11.32
E.Stroudsburg	20.25	21.51	18.98	17.44	19.39	21.03	18.21	18.27	19.81	21.29	18.54	17.92
Edinboro	15.86	17.42	16.04	13.93	15.16	16.02	14.81	13.28	15.52	16.68	15.38	13.62
Indiana	19.35	21.20	18.70	13.68	19.47	20.98	18.73	14.95	19.41	21.09	18.18	14.31
Kutztown	18.28	19.83	17.14	15.99	17.46	18.56	16.34	16.37	17.88	19.17	16.77	16.16
Lock Haven	16.07	18.29	13.84	-	16.07	17.39	14.31	-	16.07	17.85	14.07	-
Mansfield	14.06	15.91	13.53	12.06	14.75	16.32	13.11	11.78	14.71	16.11	13.33	11.93
Millersville	18.42	18.50	17.65	21.45	17.91	18.74	17.32	16.11	18.16	18.63	17.51	18.46
Shippensburg	19.01	20.43	18.57	16.61	19.73	21.31	19.43	16.13	19.37	20.87	19.00	16.38
Slippery Rock	19.69	20.81	18.63	18.51	19.40	21.33	17.73	16.72	19.54	21.07	18.17	17.65
West Chester	18.14	19.81	17.72	14.09	18.14	19.52	17.06	15.56	18.14	19.66	17.39	14.75
All Combined	18.13	19.70	17.29	15.12	18.02	19.47	17.11	14.04	18.08	19.58	17.20	15.02
82.5 Percentile	20.25	22.12	18.98	18.74	19.73	21.33	19.43	16.72	20.02	21.46	19.00	17.92
75.0 Percentile	19.59	21.20	18.63	17.44	19.47	21.03	18.73	16.37	19.54	21.09	18.54	17.56
Median	18.35	19.82	17.69	14.09	18.03	19.63	17.18	15.56	18.15	18.90	17.45	14.75

[1]Based upon FTE faculty and FTE student data, by level, found in the Common Cost Accounting Reports for Federal Years 1975-76 and 1976-77, Office of Administrative Management, Pennsylvania Department of Education. The data for both years combined was arrived at by adding together the FTE faculty figures and also the FTE student figures prior to calculation of the "both years" ratios.

HIGHLIGHTS

Faculty Workload

1. The average student-faculty ratio in the Pennsylvania state college system is decreasing slightly: 18.35:1 in 1975-76 and 18.03:1 in 1976-77.

2. FTE faculty productivity in terms of total student-credit hours decreased by 38,580 hours, or 1.7 per cent from 1975-76 to 1976-77.

3. Average institutional FTE faculty productivity decreased from 538.2 student-credit hours per FTE faculty member to 526.7 credit hours (median institution values), or 2.1 per cent.

4. Average FTE student-contact hours decreased from 220.2 in 1975-76 to 216 in 1976-77, or 1.9 per cent.

5. Average instructional credit-hour cost increased from $46.84 in 1975-76 to $51.15 in 1976-77 (median institution), or 9.2 per cent.

6. Average full credit-hour cost increased from $114.65 in 1975-76 to $121.67 in 1976-77 (median institution), or 6.1 per cent.

7. The rank order correlation between average credit-hour production per FTE faculty member and average full credit-hour cost increased from .60 to .64 between 1975-76 and 1976-77, but the corresponding correlations between average credit-hour production per FTE faculty member and average instructional credit-hour cost declined from .78 to .68. This suggests instructional productivity and costs became less closely related during this period while the relationship to total costs remained relatively constant.

Student Credit-Hour Production

8. Total student-credit hour production in education declined 45,024, or 4.8 per cent, between 1974-75 and 1975-76 and by 85,761, or 9.6 per cent, between 1975-76 and 1976-77. This indicates an accelerating decline for this program area from 41.4 per cent of the total student credit-hour production in 1974-75 to 35.3 per cent in 1976-77.

9. Notable increases in student credit-hour production also occurred during 1974-77 in business/management (195,456 to 275,104); health professions (60,116 to 75,343); public affairs/services (53,504 to 94,909); communications (20,804 to 31,582); and computer science (7,641 to 19,548). Figures also show corresponding increases in the percentage they represent of total production for these years.

10. In addition to education, notable decreases in student credit-hour production between 1974-75 and 1976-77 occurred in interdisciplinary studies (89,387 to 54,496); mathematics (75,889 to 45,248); letters (103,807 to 74,116); foreign languages (44,699 to 28,648); and library science (22,171 to 12,347)--despite an overall increase from 2,270,323 in 1974-75 to 2,289,873 in 1976-77. The 1975-76 school year was the highest point at 2,328,452 hours.

Class Size and Faculty Workload

11. While no uniform size can be imposed upon all classes, experimentation with regard to optimum class size for various subjects may be an area where the state colleges might take the lead in the search for more cost-efficient education.

FTE Faculty Efficiency Criteria

12. Since the faculty instructional load is largely fixed at 12-semester hours or their equivalent, the only immediately viable method of increasing faculty productivity is to increase the ratio of FTE students to FTE faculty.

13. Since these institutions are to some degree unique in their offerings, no one standard ratio can be imposed or adopted. The institutions will have to set goals in light of their particular student needs and situations.

14. Nevertheless, general goals can be set on the basis of the median, 75th percentile and 87.5 percentile values of the FTE student/faculty ratio.

15. Using these goals, schools with lower FTE student/FTE faculty ratios could seek to meet goal ratio standards of 18:1, 19:1 or 20:1 by strategic nonreplacement of faculty lost, or by an increase in FTE student enrollment.

16. Depending upon the goal ratio employed, the state-owned colleges would have from 188 to 439 fewer faculty if these goal ratios were applied to the 1976-77 student enrollment figures.

17. Since institutional FTE student/FTE faculty ratios tend to drop as one moves from lower level enrollments to upper level and graduate enrollments, goal standards such as median values of 19:1 for the lower division, 17:1 for the upper division, and 15:1 for graduate classes might be used for more precise setting of goals.

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